Washeteria Fire Protection in Alaska

FINAL SUBMITTAL

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1. GENERAL

A. Scope of work: the purpose of this report is to investigate the fire protection alternatives for washeterias and to make recommendations based on the practical limitations in rural Alaska.

B. Report process: this report was prepared by first gathering information regarding washeterias – existing and new, and information on fire history at washeterias. This information was collected from many different sources. A primary source of information was Alaska Native Tribal Health Corporation (ANTHC) who provided information on existing washeterias and new washeteria design, and past fire history in the State with regards to washeterias. Other sources included media reports of fires, contact with the State Fire Marshal's office, the State Troopers, and the Rural Alaska Housing Sanitation Inventory (RAHSI). All of these items were gathered, analyzed, and are discussed in more detail in this report.

C. Goals and objectives: it is hoped that this report can be used to consider appropriate fire protection features for new washeteria construction in rural Alaska. In this way, it may be possible to avoid significant fire damage to new facilities, and to reduce the impact that fire loss may have on the rural communities.

D. Trends in Alaska for fire protection: in general, Alaska has always faced a significant fire hazard and has a history of a high per capita fire incidence. For the most recent year available (1998), Alaska had the highest per capita fire death rate in the nation at 39 deaths per million population – more than twice the national average (source: U.S. Fire Administration). Alaska also has a high fire loss dollar value – reported as almost 5 times the national average (source: Cold Climate Utilities Manual, 1986). Alaska has significant challenges that contribute to the fire problem – a substantial rural population, cold climates, large areas with minimal or non-existent organized fire service, and limited water supply for fire fighting. The trend in the State has been to increase fire protection features where possible. This has included developing more public water supplies including distribution, constructing buildings with more fire protection features, and providing suppression systems in more facilities.

E. Fire history: there have been a number of serious fires in washeterias in Alaska, including some buildings that have been totally destroyed. Following is a list of fires involving washeterias based on our research. Note that due to the remoteness of the facilities, and the relatively small size and value of the buildings, there is not good record keeping associated with the fires. Our research was based on contact with

ANTHC personnel, contact with the State Fire Marshal's office, the State Troopers, Village Public Safety Office, as well as periodical searches. Given the limited official documentation of the fires, this list should be considered as tentative and not confirmed.

Table 5: Washeteria Fire History

Location	Date	Severity	Cause	Comment
Stebbins	2/9/02	Total loss	sauna area	Substantial documentation
Sheldon Point	8/31/97	Serious damage	sauna	
Sleetmute	12/20/01	Serious	faulty wiring	
Nuiqsut	late 80's	Total loss	water heater	fired equipment over combustible matls.
Gulkana			fired equip.	fired equipment over combustible matls.
Pitkas Point	late 80's		sauna	
Wainwright	late 70's	Total loss	sauna	
Emmonak	early 80's	Total loss	sauna	
Brevig Mission	late 80's	Total loss	heat tape	
Galena				
St. Michael	2001	minor	elec. @ power drop	dryer exhaust discharged onto power drop
Quinhagak		minor	smoking	person injured
McGrath	80's	Serious		

2. FACILITY DESCRIPTION

A. Washeterias: these are often the core facilities in rural Alaska that provide the benefits of safe water delivery and wastewater disposal. Washeterias may be the only source of safe drinking water for communities, especially in winter periods. In many instances, washeterias provide a location where clothes can be washed and dried, and where public showers are available for use. The use of showers and clothes washing facilities are very important – especially in communities without a public water distribution system. Even where water distribution systems exist, the cost for individuals to purchase, operate, and maintain their own washers and dryers may be prohibitively high. In many cases, these persons can use the public washeterias at much lower cost.

B. Combined washeterias/water treatment: it is very common for the washeteria facilities to be combined with other uses, and the most common co-located use is water treatment and water storage. Since the washeteria is often one of the facilities with the largest demand for water and wastewater services, it is convenient to combine the two uses. In addition to convenience, the use of a building for multiple functions results in efficiency of space layout, as well as substantial savings in construction cost and operations costs. This type of facility typically has a means to treat the raw water (for hardness as an example), to chlorinate, to store (most often an external water storage tank), and then to pressurize the piping system for delivery. The village of Rampart is an example of where a washeteria has been combined with water treatment functions.

C. Combined washeterias/other uses: to take advantage of the economy of multiple uses for single structures, washeterias have been combined with other uses besides water treatment. These other uses include health clinics, city offices, and even a jail and an apartment. Examples of these uses are as follows – combined with a clinic (Stebbins, Quinhagak), combined with city offices (McGrath – also included water treatment, clinic, and jail), and combined with an apartment. The predominant configuration however is a dedicated washeteria, or a washeteria combined with a water treatment plant and this report will concentrate on those arrangements.

D. Saunas: this use has also been combined with washeteria facilities – especially in the past. The function goes along well with the hygiene associated with showers, and has a cultural basis among native Alaska peoples as well that resulted in strong demand from the communities. In some cases, the saunas that were originally installed in facilities have been removed due to the fire danger from the equipment. Examples of

locations that had saunas installed at one time include Hooper Bay, Pitkas Point, and Beaver.

E. Size: there is significant variability on the size associated with washeteria facilities. The biggest factor is whether the building also supports additional functions as described above – such as water treatment or a clinic. In general, the washeteria portion of recently constructed facilities ranges from around 800 square feet, up to as much as 2,000 square feet. The average washeteria is estimated at around 1,000 square feet and is typically a single story. Examples of current washeteria designs were provided by ANTHC for reference; these examples included Eek at 1,700 square feet (combined with a water treatment use), and Stebbins at 1,700 square feet (only used as a washeteria). Floor plans from these two facilities can be found in Appendices C and D.

F. Construction: in general, washeteria construction is of wood framing. Foundations are often on post and pad, or mud sills (beams laid directly on ground). Occasionally, soil conditions require pile construction, or thermosiphons where warm permafrost is present. Most construction materials including flooring, roofing, and interior finishes of combustible construction. Structural members are not normally provided with a fire resistive treatment. The mechanical room where fired equipment is located is usually the only space in the building in which fire resistive wall construction is used to separate it from the remainder of the facility. A typical list of rooms present in the washeteria might include the Laundry, Dryer Room, Office, Mechanical, Men's Room, Women's Room, Storage, and Entries.

G. Locations: there are more than 100 washeterias estimated to be in use in the State. Besides the public facilities that ANTHC designs, there are also privately owned and operated washeterias – often associated with campgrounds or lodges. For the purpose of this report, we have confined the discussion to the public facilities in rural Alaska. Appendix B contains a list of known public washeterias in the state.

H. Occupancy/usage: the primary occupants of washeterias are the users of the facility. The users can come from any member of the served community – from young to old. Hours of operation vary from community to community but the facilities are typically open every day. Persons with disabilities may also be present to use the washeteria. Other persons may be present such as a manager or maintenance person. The Eek, Stebbins, and Nunam Iqua (Sheldon Point) facilities are designed to include an office where a person can be present to supervise the building as needed. Other personnel may be present on a temporary basis for maintenance or repair – especially when the washeteria includes other functions such as water treatment. Obviously, the occupancy and persons

to be found will vary considerably when other functions are present. This would be most apparent in the case of a clinic, TDY area, or jail – where persons may be sleeping or otherwise not be capable of self-evacuation without assistance.

I. Fire protection features: as described above under “construction”, there is very little passive fire protection built into current designs as it is commonly not required by the code. Most materials and surfaces are combustible, and usually the only fire separation used is at the mechanical (boiler) room. No known facilities are protected by automatic sprinkler systems or other automatic fire suppression. In some cases, “automatic” fire extinguishers have been located in the boiler room positioned over the boiler burners to provide protection in event of an incipient fire at the burners. The type of fire detection and alarm systems used in washeterias has varied substantially. It is common that no fire alarm or detection is present.

3. CODE ANALYSIS

A. Codes used in analysis and for comparison: although only a single code is promulgated by state law in Alaska, there are other codes which can be used for guidance or comparison when fire safety issues are considered. The codes which address fire safety for buildings was changed recently to use the new International Code Council series of codes, a replacement of the Uniform series of codes which have been used in the State since state law first addressed the issue. On 6/25/01, 13 AAC 15.010 was amended to make use of the new 2000 International Fire Code, the 2000 International Building Code, the 2000 International Mechanical Code, and the 2000 Uniform Plumbing Code. Other codes which can be used for guidance and comparison include the following:

i. 1997 Uniform Fire Code/ Uniform Building Code. This older version of the code was used up until recently. Many facilities have been designed and constructed under these requirements.
ii. 2000 NFPA 101 Life Safety Code. Note that NFPA 101 stresses life safety over property protection, which is a different approach than other model codes.
iii. 2002 NFPA 5000 Building Code (currently in draft form).

B. Occupancy and construction classification: note that since the approach taken by each of the model codes is different, direct comparisons can be difficult. However, for each of the code options discussed here, an occupancy classification and construction classification equivalent is presented for a washeteria, as well as a washeteria combined with a water treatment facility. All of the codes described here put few restrictions on the construction – either the materials of the structure, or fire rated protection of the structure. The codes are arranged in order of applicability – the first code listed is the code currently required for new design.

Table 1: Washeteria Code Criteria for Occupancy & Construction

	2000 IBC/IFC	1997 UBC/UFC	NFPA 101	NFPA 5000	Comment
Occupancy	F-1	F-1	Business	Business	
Construction	Type V-B	Type V-N	No minimums	Type V	Minimum req. constr.

Table 2: Water Treatment Code Criteria for Occupancy & Construction					
	2000 IBC/IFC	1997 UBC/UFC	NFPA 101	NFPA 5000	Comment
Occupancy	F-1	F-1	Industrial	Industrial (ord. hazard)	
Construction	Type V-B	Type V-N	No minimums	Type V	Minimum

Classification assumes oxidizers storage and use is under exempt amounts of 2000 IBC.

C. Allowed area/construction: as can be seen by Tables 1 and 2 above, there are few restrictions on construction type for either washeterias, or washeterias with combined water treatment functions. This means that any permitted building material (including wood) can be used, and no fire rated protection of the structure is required. The way the model codes are arranged is that the function and type of construction are used to determine the maximum building area allowable for those two criteria. If the area desired exceeds that permitted by the codes, then a more restrictive construction type is needed. For example, if the desired area for a building of type V-B is exceeded, the project might be able to proceed using a V-A construction type. Following are tables for the model codes as they relate to allowable area for the least stringent construction types allowed shown in Tables 1 and 2. The net result is that the codes have similar area limitations ranging from 8,000 to 9,000 square feet using the least stringent construction type.

Table 3: Allowable Area (square feet)					
	2000 IBC/IFC	1997 UBC/UFC	NFPA 101	NFPA 5000	Comment
Washeteria	8,500	8,000	N/A*	9,000	
Water treatment	8,500	8,000	N/A*	8,500	

*No restrictions on area.

D. Required fire protection features: the model codes establish certain conditions under which fire protection features are required. These features would include portable fire extinguishers, fire detection and alarm systems, and fire suppression (sprinkler) systems. These conditions can be based on occupancy, height, number of stories, or other factors. For the table below, we have assumed the typical washeteria construction (least stringent), and typical size. For example, in most cases, the IBC would require an automatic fire suppression system to be installed where the occupancy is classified as “H” – or hazardous. For the majority of washeterias, the codes require portable fire extinguishers, but no fire alarm or sprinklers.

Table 4: Required Fire Protection Features					
	2000 IBC/IFC	1997 UBC/UFC	NFPA 101	NFPA 5000	Comment
Washeteria	PFE*	None	PFE*	PFE*	
Water treatment	PFE*	None	None	None	

* PFE = Portable Fire Extinguisher

4. ALTERNATIVES

A. Additional passive features: one possible approach to increase the fire protection aspects of new construction is to increase the passive fire protection features of the building. Passive fire protection refers to elements of construction which will make the facility less susceptible to fire without active intervention. These features could include use of non-combustible construction materials, non-combustible finishes, fire rated protection of structural elements, and increased fire rated separations within the facility. The value of these options would be the reduced chance of incipient fire, the reduction in ready fire spread when a fire is ignited, and protection of the structure during a serious fire – allowing more time for firefighting operations.

B. Fire detection and alarm options: as was noted previously, the application of fire detection to washeteria facilities has been varied in the past. The addition of a detection and alarm system could provide more rapid detection of a fire, allowing firefighting to occur much earlier in the fire development. This can be critical when the local fire department has limited resources as is often the case in communities with washeterias. As with any active system, system maintenance will be required and this can be a challenge in remote communities where skilled personnel are not readily available.

C. Fire suppression alternatives: there is no known instance of a washeteria that is protected by a conventional automatic sprinkler system. As noted previously, there are some locations where boilers have “automatic” fire extinguishers located above the burners, but complete facility protection has not been applied. Conventional sprinkler protection should be considered, as if it had been installed, it may have saved some of the facilities that have been lost to fire in the past. Some possible suppression alternatives are discussed below:

i. Conventional sprinkler/conventional storage – this option would be a conventional automatic sprinkler system, such as per NFPA 13. In addition, conventional water storage would also be included which would typically require dedicated water storage for 30 to 60 minutes of design sprinkler water discharge. This option provides the most complete protection from fire, but carries the largest burden of cost and maintenance requirements. Both dry pipe and wet pipe sprinklers are possible for application. The wet pipe system is the simplest and least expensive, but is vulnerable to freezing conditions in the space. The dry pipe system piping and heads, or an anti-freeze system, are less vulnerable to freezing temperatures. A fire pump may be needed to provide sufficient water pressure for the sprinkler system.

ii. Conventional sprinkler/limited storage – this option has the same sprinkler protection as described above, compliant with NFPA 13 but provides only limited water for suppression. This is an approach that the State Fire Marshal has accepted in the past as a means of improving fire protection without the substantial cost of full water storage. A figure that has been used in the past such as by FM (Factory Mutual) is 10 minutes of storage which is a substantial reduction from the 30 to 60 minutes for conventional storage.

iii. NFPA 13R and NFPA 13D systems: these two standards are available and are much less stringent than the conventional systems described in NFPA 13. NFPA 13D is intended to apply to single or two family residences, and NFPA 13R is applied for residential occupancies up to 4 stories in height. The requirements of these two residential standards are much less demanding that NFPA 13 systems for the following reasons: the required sprinkler discharge density is much less, the operation area is smaller or the number of sprinklers is fewer, the required period of water storage is less, and sprinklers can be omitted from some locations (unlike NFPA 13). These reduced requirements make sprinkler systems under these standards smaller, and less expensive. In addition, the minimal water needs have allowed for the development of some pre-engineered systems which do not require a developed water system or fire pump. These pre-engineered systems make use of nitrogen or other compressed gases to pressurize the water system. There are other material and system options available with the residential systems that are not permitted for conventional systems. Although these alternative standards are very attractive from a cost perspective, and from the flexibility allowed, there are some very real constraints that make their application problematic. The NFPA 13D and 13R standards were developed for residential construction – not commercial or institutional facilities. The expected fire load and rate of heat release are completely different, and an NFPA 13D system may not control or extinguish a fire in a commercial structure. The other major concern is that of approach; NFPA 13D and 13R are primarily life safety systems whose goal is to allow evacuation in the event of fire, where NFPA 13 is designed to protect the structure and contents from major loss. While the issue of use of residential standards could be broached with the Fire Marshal, they are not likely to be successfully applied to washeterias.

iv. Alternative sprinkler systems – there are some options available which could reduce cost or water storage requirements. These include packaged mist systems; mist sprinkler protection discharges extremely fine droplets of water (as small as 80 to 200 microns) rather than the large drops produced by conventional sprinklers. Mist sprinklers are available in pre-engineered systems which are listed, but only for limited protected space volumes (the Securiplex Fire-Scope 2000 system for example is listed up to 9,175 cubic feet). Systems are also

available which use conventional water supplies and piping, but the listing of the components lags behind other options. Mist sprinkler systems represent a significant advantage over conventional sprinklers in that they require much less water to operate – typically 1/3 or less. This means that less water storage is required, and water damage is reduced. Mist sprinklers also can be more penetrating than conventional sprinklers, as the droplets are so fine they can behave more like a gas than a liquid. The disadvantage of mist protection is the increased complexity of both pre-engineered systems, and custom designs. More pressure is required, and some systems require high pressure gases for discharge.

v. Dry agent suppression options – there are some suppression options which do not use water which could be considered for application. These include dry chemical, FM-200, Inergen, carbon dioxide, and Halon. The dry chemical approach would be similar to what is now occasionally done with the "automatic" fire extinguishers over the boilers. Pre-engineered cylinders can be used, networked together, to protect a limited volume. It would probably not be practical for complete facility protection due to cost and complexity. Carbon dioxide is an asphyxiant and is not recommended for facilities which may be occupied. Halon is available, but is not recommended for new construction due to limitations on availability since production has ended in North America. FM-200 and Inergen are gaseous agents which can protect relatively large volumes and represent little risk to occupants. Unfortunately, their application for a space as large as a washeteria would be expensive, and would also require a complete fire detection and alarm system. The level of complexity for such a system would be very high.

vi. Budget cost comparisons: following are some very rough approximations of the various fire protection alternatives. These figures have been estimated based on a conventional washeteria located in a remote part of Alaska. The estimates for the sprinkler system do not include the possibility of water storage or a fire pump.

Table 5: Rough Costs of Fire Protection Features

System	Cost ($/square foot)
Conventional sprinkler	$8
Fire detection and alarm	$14
FM-200 (gas agent) w/fire alarm	$50

D. Operations and maintenance cost ramifications: increasing the fire protection features of washeterias will have an impact on construction cost, but will increase operations and maintenance costs as well. For passive protection features, the impact will probably be minor, but sheetrock finishes and structural member protection will be more fragile than finishes currently used. For fire detection and alarm systems, annual inspection and occasional maintenance and repair will be needed. Since

the technical support will probably not be locally available, a special trip to the community will have to be scheduled to keep the system in good operating condition. For suppression systems, a similar level of inspection and maintenance will be needed. Wet pipe systems are required to be inspected on an annual basis, and dry pipe systems require inspection every 6 months. Since a number of community schools have sprinkler systems, it would be possible to combine the washeteria inspection with the technician visit to the school to save money. The use of alternative suppression systems described above will likely result in the need for semi-annual inspections at least. There is also the possibility of damage resulting from vandalism or accidental discharge of suppression systems. The costs for the inspection and maintenance of these systems must be considered along with the normally expected operating costs. The most effective fire protection features can be rendered inoperative by insufficient maintenance.

5. RECOMMENDATIONS

A. General: the first question that occurs when reviewing the fire protection features present in current washeteria design is whether or not additional fire protection features are needed. Based on the partial list of fire losses for washeterias, it appears as if losses have been substantial and additional measures would be justified. The list of fires in washeterias seems to indicate a recurring problem, and one that has often resulted in a complete loss of the facility to fire. Based on the information gathered for this report, we recommend that additional fire protection features beyond code minimums be added to new construction of washeterias to reduce the risk from fire, and to reduce the resultant damage if a fire does occur.

B. Alternative discussions: as previously discussed, the options available to improve protection from fire come from three areas – passive fire protection, fire detection and alarm, and fire suppression. Increasing the protection in each of these areas must be weighed against the increased cost, the increased complexity, and the increased expense of system maintenance. These issues could be evaluated through the use of life cycle costs. Due to the variation between communities in terms of washeteria design, maintenance personnel, cost of travel to the community, and available fire department response – it is difficult to generalize and make a blanket recommendation for all washeterias, but we have some suggestions as follows:

i. Passive fire protection – we recommend that all washeterias be considered for improved passive fire protection. This would include a reduction or elimination of combustible surfaces and finishes, protection of structural members with fire rated treatment, and the use of non-combustible construction materials should be considered. The maintenance of these types of materials will be more costly and more frequent than plywood finishes, but can probably still be accomplished with locally available labor. A possibility would be to upgrade the construction type to V-A (IBC 2000). An example of a possible material for use in protecting exposed soffits would be the G-P Gypsum ToughRock Soffit Board.

ii. Fire Detection and Alarm System (FDAS): there are two primary values to the installation for a fire detection and alarm system, and those are the notification of occupants of a fire condition to allow evacuation, and notification of firefighters to allow for rapid response. The fire history of washeterias does not seem to indicate a problem with notification of occupants, and occupants are generally aware and capable of self-evacuation if necessary. To reduce the severity of fire loss, the notification aspect of the FDAS could be used to alert the local fire department or other officials. Since the firefighting capability

varies so widely among communities, our recommendation is that for communities with an organized fire department or a planned response for fire, that fire detection and alarm systems be installed with exterior horns and strobes, and where possible, with remote annunciation of fire conditions. This remote location could be a fire department (where present), a Village Public Safety Officer, a community official, or even to a pager. Where organized response to a fire is not available, an FDAS may still be useful, but may not increase the fire protection of the facility to the same extent.

iii. Portable fire extinguishers: as a first line of defense against incipient fires, we recommend that all washeterias have portable fire extinguishers. This is actually a code requirement under the 2000 IBC/IFC and under NFPA 101. We would recommend that the extinguishers be provided in accordance with NFPA 10 - Standard for Portable Fire Extinguishers, 2002 Edition.

C. Fire suppression recommendations: a number of suppression options were previously discussed. The options based on something other than water are probably not practical for reasons of complexity and cost – the cost being both initial construction cost and maintenance. These options that are not recommended include dry chemical, carbon dioxide, Halon, and other gaseous agents (FM-200, Inergen). Water-based systems are probably the best choice for rural fire protection on the scale needed for washeterias. Water fire suppression systems are usually relatively simple, reliable, and have a great track record for successful operation. Our suggestions are as follows:

i. Washeterias with adjacent water storage: consider a conventional sprinkler system. This will provide the most complete fire protection of the facility and a reasonable degree of confidence. Required elements for the system would be - use of water storage tank (assumed to be the drinking water storage tank already present), sprinklers and piping, and a fire pump.

ii. Washeterias with limited water supplies: where only a limited flow is available to the building from public or local water supply, some minimal storage could be developed such as for a 10 minute water supply. Required elements for the system would be – new water storage tank (minimal storage), sprinklers and piping, and fire pump.

iii. Fire pumps: these pumps will probably be required to maintain sufficient pressure in the piping system for the sprinklers to operate properly. NFPA 20 - the standard on fire pumps, requires that diesel engines be used to drive fire pumps unless the electrical power available is deemed “reliable”. In general, the power supply in remote communities is usually not considered reliable, and diesel engine drives are recommended for fire pumps. The disadvantage to the diesel engine drivers is that the initial cost may be slightly higher, more space may be needed for the pumps, and more pump accessories are

needed (dedicated fuel oil tank, ventilation, etc,). The advantage is that this is the most reliable means of pressurization and diesel engine fire pumps have an excellent history of protecting facilities.

D. Issues for future consideration: there are a number of other areas where fire protection for washeterias could be improved for both new and existing facilities. Some of these ideas are noted below for consideration for both existing and new facilities:
   i. Relocation of high hazard functions: saunas have been linked to a number of fires in washeterias. Since a sauna is not a requirement of the washeteria whose primary goal is sanitation for the community, we recommend that saunas no longer be included in washeterias or allowed to be located within 20 feet of a washeteria. Where saunas are currently installed, we recommend their removal or relocation.
   ii. Ignition control: although smoking has not been reported as a major factor in the known fires, it may have been a contributing factor (NFPA reports that smoking materials are the leading cause of fire deaths in the United States). We suggest a control of possible ignition sources in washeterias including smoking and open flames.
   iii. Inventory and condition survey: a number of reported fires seem to have been exacerbated by unsafe operation or conditions. We suggest that a plan be put in operation for qualified personnel to visit each of the existing washeterias to observe the conditions, and to make recommendations for improving the fire safety aspects of the facilities.
   iv. Inspection services: we recommend that an ongoing effort be made to observe the condition of washeterias, and especially to monitor fire protection features of the building. This could be done on an annual basis, and it may be possible to involve the State Fire Marshal when their personnel travel to the community schools for inspections.
   v. Insurance requirements: there may be a way to involve other parties in the goal of achieving lower fire losses. One possibility is to ensure that facilities are insured for loss from fire. When this requirement is met, a 3rd party – not the community and not ANTHC or a governmental agency – will have an interest in a well-maintained, fire safe building and could provide expertise in analysis, and prevention. It would also provide a funding source for repair or replacement if a substantial loss occurs.

6. APPENDIX
   A. Bibliography (information sources).
   B. Partial list of washeteria locations.
   C. Typical drawing of washeteria.
   D. Typical drawing of washeteria/water treatment building.

Appendix A: Bibliography (information sources).

U.S. Fire Administration web site (www.usfa.fema.gov), 8/26/02.

Alaska State Fire Marshal's Office web site (www.dps.state.ak.us/fire), 9/19/02.

ANTHC personnel – Chet Crafts, Mark Anderson, Art Ronimus, John Warren, Ralph Hoagge, John Thein: 9/17/02 – 9/18/02.

Rural Alaska Housing Sanitation Inventory (http://208.159.91.14), 8/26/02.

1999 Drinking Water Infrastructure Needs Survey, February 2001, U.S. EPA.

Division of Environmental Health (http://www.state.ak.us/local/akpages/ENV.CONSERV/deh/sanitat/impact.htm), 8/26/02.

National Fire Protection Association (NFPA) Research Fact Sheets, January 2002 (http://www.nfpa.org/Research/NFPAFactSheets/Dryer/Dryer.asp).

Nome Nugget, 2/14/02 – fire report on Stebbins Washeteria.

Nome Nugget, 2/28/02 – fire report on Stebbins Washeteria.

Appendix B: Partial list of washeteria locations.

APP. B: COMMUNITIES WITH WASHETERIAS
P:\2001\A01017.09\Final\[COMMUNITIES-FORMATTED.xls]Sheet1
Updated: 10/01/02

COMMUNITY	WASH. OPERATOR
Adak	
Akiachak	
Akiak	
Akutan	
Alakanuk	
Allakaket	
Anaktuvuk Pass	
Angoon	
Aniak	
Anvik	
Arctic Village	
Atmautluak	
Atqasuk	
Beaver	
Birch Creek	Village Council
Brevig Mission	
Buckland	
Chalkyitsik	Village Council
Chevak	
Chignik Lake	Village Council
Chitina	Village Council
Chuathbaluk	
Circle	Village Council
Crooked Creek	Village Council
Deering	
Diomede	
Eek	
Emmonak	
Fort Yukon	
Gambell	
Golovin	
Goodnews Bay	
Grayling	
Healy Lake	Village Council
Holy Cross	
Hoonah	City Marina
Hooper Bay	
Hughes	
Huslia	
Igiugig	Village Council
Iliamna	Village Council
Kaktovik	Borough
Kaltag	
Kasigluk	Village Council
Kivalina	
Kobuk	

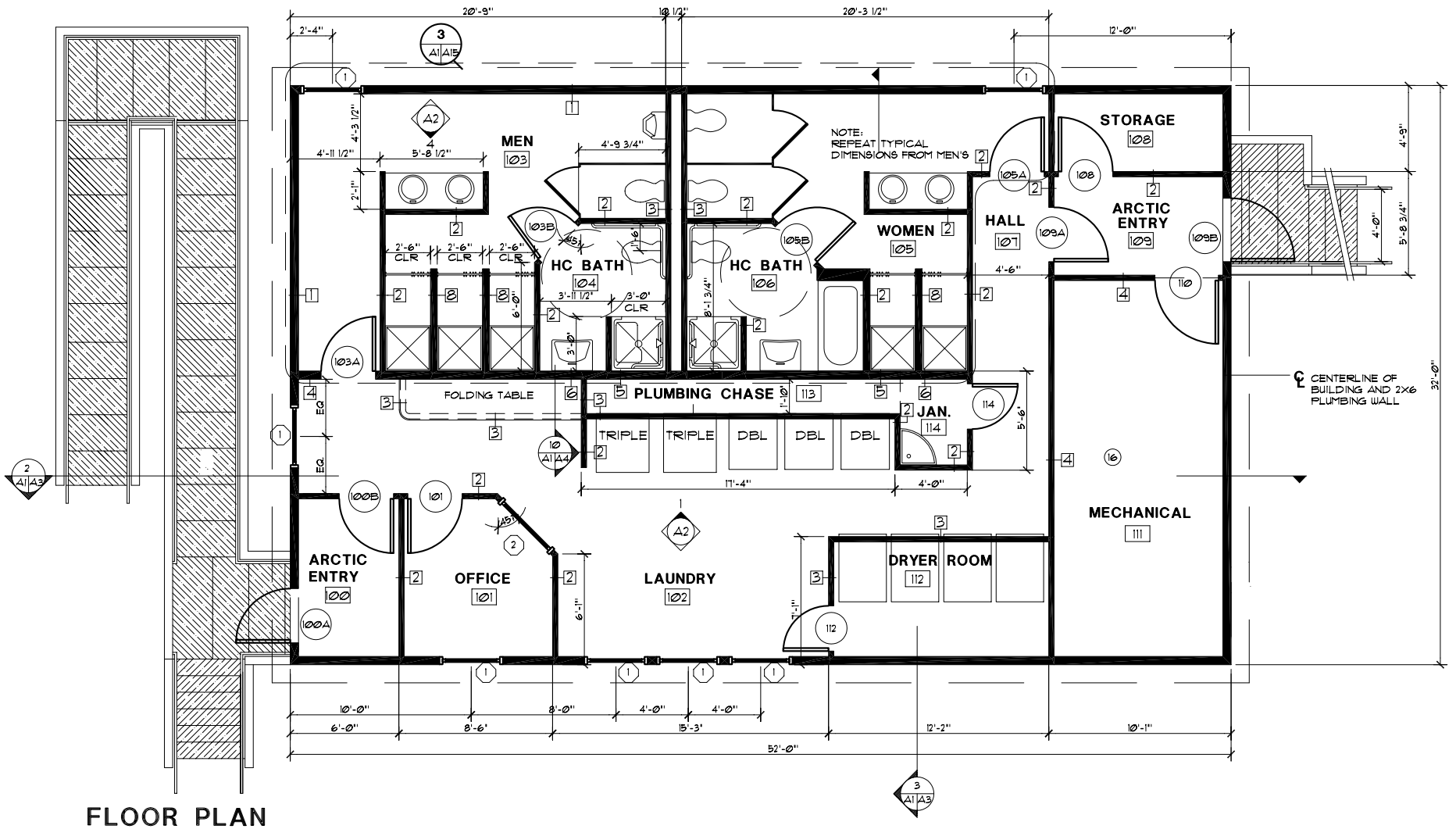
APP. B: COMMUNITIES WITH WASHETERIAS
P:\2001\A01017.09\Final\[COMMUNITIES-FORMATTED.xls]Sheet1
Updated: 10/01/02

COMMUNITY	WASH. OPERATOR
Kokhanok	Kokhanok Improvement Corporation
Kongiganak	Village Council
Kotlik	
Koyuk	
Koyukuk	
Kwethluk	
Kwigillingok	Village Council
Levelock	Village Council
Manley Hot Springs	Manley Hot Springs Community Association
McGrath	
McKinley Park	Public&Private
Mekoryuk	
Mentasta Lake	Village Council & housing authority
Metlakatla	private/island laundromat
Napakiak	
Napaskiak	Village Council
Nelson Lagoon	Village Council
New Stuyahok	Village Council/Splish Splash Washout center
Newhalen	Village Council
Newtok	Village Council
Nikolai	
Northway	Northway Village Council
Northway Village	Village Council/Naabia Niign ltd. Laundromat
Nuiqsut	Borough
Nulato	
Nunapitchuk	
Oscarville	Village Council
Pedro Bay	Village Council
Pitka's Point	Village Council
Point Baker	Point Baker Trading Post
Point Hope	Borough
Point Lay	Borough
Port Clarence	U.S.C.G
Port Graham	Village Corporation
Quinhagak	Village Council
Rampart	Village Council
Ruby	
Saint Michael	
Savoonga	
Selawik	
Shageluk	
Shaktoolik	
Shishmaref	
Stebbins	
Stevens Village	Village Council
Stony River	Village council

APP. B: COMMUNITIES WITH WASHETERIAS
P:\2001\A01017.09\Final\[COMMUNITIES-FORMATTED.xls]Sheet1
Updated: 10/01/02

COMMUNITY	WASH. OPERATOR
Takotna	Village Council
Tanacross	Village council
Tanana	Too'gha
Teller	
Tetlin	Village Council
Toksook Bay	Village Council
Tuluksak	Village Council
Tuntutuliak	Village Council
Tununak	Traditional Council
Twin Hills	Village Council
Tyonek	Village Council
Unalakleet	Villlage Corp/Wash n Go
Venetie	Village Council
Wainwright	Borough
Wales	
White Mountain	
Whitestone Logging Camp	Hoonah

Appendix C: Typical drawing of washeteria.



FLOOR PLAN

2' 1' 0 2' 4' 6'

5-15-03	DESIGN:	**SAMPLE WASHETERIA FLOOR PLAN (STEBBINS)**
PROJ. No. A01017.09	DRAWN: BC	
FIGURE C	CHECK: TJ	
	SCALE: NONE	

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Consulting Engineers
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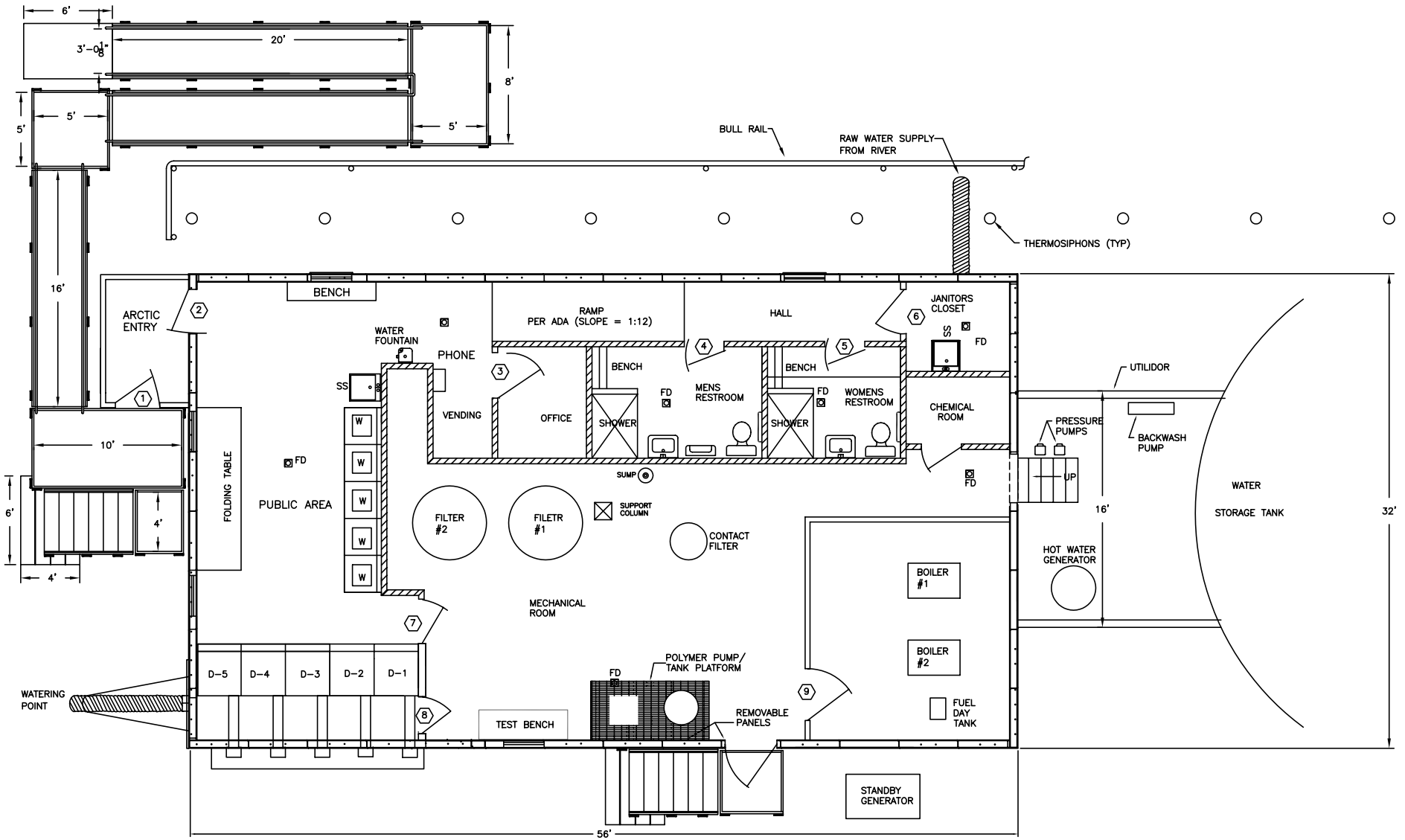
Appendix D: Typical drawing of washeteria/water treatment building.



FLOOR PLAN

2' 1' 0 2' 4' 6'

6-16-03 PROJ. No. A01017.09 FIGURE D	DESIGN: DRAWN: BC CHECK: TJ SCALE: NONE	**SAMPLE WASHETERIA FLOOR PLAN WITH WATER TREATMENT FUNCTION (EEK)**

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Appendix E: Scope of Work for project.

WASHETERIA FIRE PROTECTION ENGINEERING REPORT REQUIRMENTS

BACKGROUND: During the later part of FY 2001 the Denali Commission received funding to be spent on new and renovated washeteria. On February 9, 2002 the Stebbins washeteria caught fire and burned to the ground. Later in the spring the Denali Commission funded three new washeteria and a replacement washeteria for Stebbins. Part of the Denali Commission funding was granted to provide practical fire suppression systems for each of the new washeteria.

Washeterias are often the core facilities that provide the benefits of safe water delivery and wastewater disposal to the residents of rural Alaska. In many instances washeterias are combine with water treatment plants and may even include or be adjacent to the communities water storage facilities. In some instances the washeteria may be included in combine facilities such as: clinics, city offices, and saunas.

PURPOSE: The purpose of the proposed contract is to investigate the fire protection alternatives for washeterias as described above and make recommendations based on the practical limitations existing in rural Alaska.

TASKS:

1. Review the causes of past washeteria fires in rural Alaska to develop statistics on causes of these fires. Use these statistics to assist in developing alternatives discussed below.
    a. Sources for information may include fire marshal or state trooper reports.
    b. Another possible source for this information is interviews of people working for ANTHC.
    c. Newspapers may also be used.
    d. This is only expected to result in one or two pages in the final report.
    e. The level of effort is only expected to be a day or two of time.
2. Develop alternatives to provide fire protection of washeterias in rural Alaska. These alternatives should be developed considering the following:
    a. ANTHC will provide information for use in the report, including the range of locations, sizes of facilities, costs, and pertinent details of construction.
    b. The area of consideration for this report will be the interior of the building and the exterior of the building up to and including the location of the building on the lot, the location of other buildings near by, and the location of fuel tanks or other possible sources of fires.
    c. Primarily new construction.
    d. UBC/UFC, IBC/IFC, and NFPA 101.
    e. Code review should be for the general case rather than a specific building or site.
    f. Fire protection features to be considered should include passive protection, active protection, and fire department response.
    g. Likely elements of active protection should include: Fire Detection and Alarm System, water connection, water storage tank, fire pump, and sprinkler system.
    h. Use of glycol additives in sprinkler systems is a possibility that must be considered.
    i. Use of dry pipe sprinklers is also a possibility that must be considered.

j. Other alternatives that must be considered include: dry agent suppression, "automatic" fire extinguishers and residential level protection.
k. Alternatives other than code compliant systems should be discussed also.

3. Evaluate the alternatives developed under task 2 considering the background information provided above.
   a. O&M issues are important and should be evaluated and discussed in the report.
   b. Risk assessment factors should include: persons present, ability to self-evacuate, property value, ramifications of loss of use, and time for replacement.
   c. Use of diesel engine drives on fire pumps may represent an O&M burden and may be a weak link in the system so it should be addressed in the report.
   d. Evaluation should consider trends in industry and in Alaska and should be supported by statistical information where available.
   e. Will the fire prevention alternatives result in lower insurance rates or result in the possibility of insurance coverage?
4. Write report that presents alternatives and recommendations for fire protection of rural Alaska washeterias.
   a. One specific part of the report should discuss the combine facilities as described in "Background" above.

DELIVERABLES AND SCHEDULE:

	Deliverable	Schedule
1.	Draft Alternatives Summary	7/26/02
2.	Draft Report (approximately 10 pages of text and tables and 10 pages of appendix materials, 5 hard copies are required for review)	8/12/02
3.	Review Conference (at 1901 South Bragaw Street)	8/19/02
4.	Final Report (8 hard copies and one electronic copy are required)	8/30/02
5.	Not site visits are required.	